

ABSTRACT OF THE DISCLOSURE

Optical structures and methods for manufacturing the same includes, in one embodiment, a substrate and a plurality of two-sided optical components disposed along the substrate. Each component includes optical microstructures on each side. At least a

5 portion of one side of at least some of the components is air-backed and the other side of the at least some of the components is substantially wetted-out by a material.

Retroreflective optical structures, threads, or fibers and manufacturing methods for forming same are also provided. Optical structures are provided that include a plurality of microstructures enclosed within an outer layer that is formed from a single substrate.

10 An apparatus and method are also provided for forming an optical structure comprising injecting a material into a mold to form the optical structure, forming the optical structure into a desired geometric shape, and sealing ends of the optical structure.